PROJECT REPORT

PROJECT NAME : GAS LEAKAGE DETECTION AND MONITORING SYSTEM

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# PROJECT OVERVIEW:

* This project helps the industries in monitoring the emission of harmful gases
* In several areas, the gas sensors will be integrated to monitor the gas leakage
* If in any area gas leakage is detected the admins will be notified along with the location
* In the web application, admins can view the sensor parameters.

# PURPOSE:

Gas leakage detection systems are an integral part of a safety system, providing the first line of defense against the possible disasters of gas leakage. It **detects the gas leakage and triggers an alert system to activate safety precautions**.

# LITERAURE SURVEY:

Abstract: Combustible gas detection and measurement

has become essential in many fields. Combustible gas

leakages are capable of reaching large areas, affecting

entire neighborhoods or even cities, causing devastating

environmental impacts. This documentation presents an

industrial monitoring system design using Internet of

Things (IOT). This gas sensor which has captured

information about combustible gas leakage will be posted

into a data cloud. The gas sensor is capable of detecting the

leakage of combustible gas under most of the atmospheric

conditions. All the components are controlled by an

Arduino that acts as a central processor unit in the setup.

As soon as a combustible gas leakage was detected by the

sensor, the alarm will be raised in the form of a buzzer.

This alarm supports a small LCD to show the leakage

location, to alert the respected person to turn on the

exhaust fans or stop incoming gas in the particular section

to extract the gas leakage. The capabilities of this gas

detection system are not only to monitor continuously the

surroundings but are also to help to prevent the gas

leakage and hence minimizing the chances of fire and

damage.

INTRODUCTION

Safety at Industrial places like CNG and LPG should be

always a priority. As we all know that Gas leakage always

been a major problem with industrial sector, residential

areas and gas driven vehicles such as CNG (Compressed

Natural Gas) buses, cars etc. Security is the level protection against dangers and losses. The help of this technology is needed to provide an early warning alert in

order to ensure that enough time is available to prevent

many potential dangers. There is always a risk of leakage

whenever and wherever combustible gas is used,

threatening human lives and properties. Therefore,

designing a low-cost gas leakage detector helps in

minimizing this risk over a span of few years. There have

been several accidents caused by combustible gases (LPG

or methane) leakages in homes and industries. These leakages had led to the loss of several lives and

properties through fire outbreaks and explosions. One

such prevention methods to stop these kind of accidents

related with the gas leakage is to install a gas leakage

detecting device at permeable places. The ultimate goal of

this project is to design and develop such kind of a device

which is capable to automatically detect and

simultaneously stops the gas leakage in those permeable

areas. The combustible gases can be detected by this

system which has a gas sensor and it uses GSM to give the

alarm to the person about the leakage of gas through a

message or a call. When the combustible gas level exceeds

the gas concentrations more than permissible levels, the

device and sensor senses the leakage and the sensors

output goes low. This is detected by the microcontroller

and the LEDs and buzzers are turned on simultaneously.

EXISTING SYSTEM

There are numerous reviews regarding the topic of

combustible gas leakage detection techniques were wiped

out the past either as a part of research papers/technical

reports on a particular leak detection method and other

gas related subjects. Ch. Manohar and N. Sushma in 2008;

they had introduced an automatic gas leakage detector and

an indicating robot based on Android. They have proposed

that this prototype model has a small mobile or a device

which is capable of detecting the gas leakage at the

hazardous and permeable places. Whenever there's an

event of gas leakage during a particular allocated place the

robot will immediately read and sends the info to android

mobile connected to the robot through the means of

wireless communications like Bluetooth. The aim is to develop an android application for android based smart

phones which is capable to receive data from robot

directly through Bluetooth. This application warns the

person with an indication whenever there is an occurrence

of gas leakage at that particular hazardous place.

DESIGN AND DEVELOPMENT

Most combustible gases are basically a mixture of

propane and butane which are highly inflammable

chemicals. It’s odorless gas in its wild to which Ethyl

Mercaptan is added as powerful smelling agent, so as that

leakage are often easily detected. We’ll detect the LPG

leakage within the cars, industrial sectors and residential

areas employing an ideal gas Sensor. We’ll easily

implement the LPG gas leakage detector unit into a unit

which can sound an alarm or provides a visible suggestion

of the LPG concentration during a 16×2 LCD display. The

sensor utilized during this project has both admirable

sensitivity and rapid response time. This sensor also can

be wont to sense other gases like isobutene, propane, LNG

and even cigarette smoke. The output of the sensor goes

low as soon because the LPG sensor senses any gas

leakage. this is often detected by the microcontroller and

thus the LED & buzzer are turned on. After a delay of few

milliseconds, the fan is additionally turned on for throwing

the gas out.

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IMPLEMENTATION

After the planning implementation, the device

accurately detected the simulated gas leakages and a

message was generated through the Wi-Fi network. The message was transmitted to the server to arm the buzzer for the aim of user alert. On an equivalent time the exhaust

fans were automatically activated to suck out the leaked

gas from the cavity , to stop potential ignition and fire

hazards. This smart device gives many safety beneficial

signs which are vital for early gas leakage detection, and

response towards preventing LPG leakage. With small

modifications the system also can be used for household

purposes to stop house gas leakages.

CONCLUSION

Finally, we can conclude that in recent households,

the use of LPG is taking a big toll. From the use of cylinder

to the use of petroleum pipelines. The biggest problem for

using this technology is security. And this project will

prove to be a boom for the households and industries.

There are a good sorts of leak detecting

techniques are available for gas pipelines. Some techniques

are improved since their first proposal and a few new ones

were designed as a result of advances in sensor

manufacturing and computing power. However, each

detection method comes with its ups and downs. Leak

detection techniques in each category share some ups and downs. This project is very cost efficient and provides very on gas leakage hence can be used in various fields and industries.

# CODE:

|  |  |
| --- | --- |
| #include <LiquidCrystal.h> |  |
|  | LiquidCrystal lcd(5,6,8,9,10,11); |
|  |  |
|  | int redled = 2; |
|  | int greenled = 3; |
|  | int buzzer = 4; |
|  | int sensor = A0; |
|  | int sensorThresh = 400; |
|  |  |
|  | void setup() |
|  | { |
|  | pinMode(redled, OUTPUT); |
|  | pinMode(greenled,OUTPUT); |
|  | pinMode(buzzer,OUTPUT); |
|  | pinMode(sensor,INPUT); |
|  | Serial.begin(9600); |
|  | lcd.begin(16,2); |
|  | } |
|  |  |
|  | void loop() |
|  | { |
|  | int analogValue = analogRead(sensor); |
|  | Serial.print(analogValue); |
|  | if(analogValue>sensorThresh) |
|  | { |
|  | digitalWrite(redled,HIGH); |
|  | digitalWrite(greenled,LOW); |
|  | tone(buzzer,1000,10000); |
|  | lcd.clear(); |
|  | lcd.setCursor(0,1); |
|  | lcd.print("ALERT"); |
|  | delay(1000); |
|  | lcd.clear(); |
|  | lcd.setCursor(0,1); |
|  | lcd.print("EVACUATE"); |
|  | delay(1000); |
|  | } |
|  | else |
|  | { |
|  | digitalWrite(greenled,HIGH); |
|  | digitalWrite(redled,LOW); |
|  | noTone(buzzer); |
|  | lcd.clear(); |
|  | lcd.setCursor(0,0); |
|  | lcd.print("SAFE"); |
|  | delay(1000); |
|  | lcd.clear(); |
|  | lcd.setCursor(0,1); |
|  | lcd.print("ALL CLEAR"); |
|  | delay(1000); |
|  | } |
|  |  |
|  | } |

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GITHUB LINK :<https://github.com/IBM-EPBL/IBM-Project-9990-1659088253>

